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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,710	04/25/2005	Thomas Lotzbeyer	NY-HUBR-1278-Us	8905
24972	7590	08/29/2006	EXAMINER	
FULBRIGHT & JAWORSKI, LLP 666 FIFTH AVE NEW YORK, NY 10103-3198			FERNANDEZ, SUSAN EMILY	
			ART UNIT	PAPER NUMBER

1651

DATE MAILED: 08/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/528,710	LOTZBEYER ET AL.	
	Examiner	Art Unit	
	Susan E. Fernandez	1651	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 24-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24-39 is/are rejected.
- 7) ☒ Claim(s) 37 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/22/05, 6/20/05</u> | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

The amendment filed June 14, 2006, has been received and entered.

Claims 1-23 and 40-47 are canceled. Claims 24-39 are pending.

### ***Election/Restrictions***

Applicant's election without traverse of Group I, claims 24-39, Chenopodiaceae for species (a), arabinoxylan derived from flour for species (b), and potatoes for species (c), in the reply filed on June 14, 2006, is acknowledged.

Claims 24-39 are examined on the merits, to the extent they read on the elected subject matter and species.

### ***Claim Objections***

Claim 37 is objected to because of the following informalities: Claim 37 is grammatically improper since it recites "the enzyme responsible for the modification are..." It is suggested that "are" following "the modification" be replaced with "is." Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 24-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 24 is rendered by the recitation "increased viscosity" since it is unclear what viscosity it is being compared to in order for it to be considered "increased." Since no point of comparison is provided, it is unclear what viscosity the water-containing medium may have. The last paragraph on page 5 of the specification is noted, but this paragraph does not clearly address the issues described above. Additionally, the recitation "modified with the aid of polyphenol oxidases" at lines 2 and 3 of the claim is confusing since it is unclear whether polyphenol oxidases actually modify the gellable polymer component. Also, claim 24 is indefinite since the recitation "...wherein it is modified..." at the last line of the claim is unclear. It is unclear what "it" is. Moreover, it is not clear whether the gellable polymer component is modified with the aid of polyphenol oxidase in addition to being modified by a protein with tyrosinase activity, or whether the polyphenol oxidase is a protein with tyrosinase activity. For examination purposes, the gellable polymer component will be considered to be a gellable polymer component with phenolic substituents modified by polyphenol oxidases, wherein the polyphenol oxidases are proteins with tyrosinase activity. Given the lack of clarity of claim 24, claims 24-39 are rejected under 35 U.S.C. 112, second paragraph.

Claims 25 and 26 are indefinite because it is not clear what is "it" recited at the first lines of each of the claims. For examination purposes, "it" of claim 25 will be considered to be the phenolic substituents of claim 24, and "it" of claim 26 will be considered to be the water-containing medium of claim 24.

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Claim 26 is indefinite since the term “optionally” in the claim does not clearly indicate whether the gel is in a dried, partially dried, rehydrated or partially rehydrated state. The metes and bounds of the claim are unclear because of the term.

Claim 28 is rendered indefinite by the recitation “(un)substituted.” It is unclear whether the cinnamic ester groups are unsubstituted or substituted. Thus, claims 28-32 are rejected under 35 U.S.C. 112, second paragraph.

Claim 30 is indefinite because of the recitation “...pectin that is derived from Chenopodiaceae...” It is unclear how the pectin can be derived from the Chenopodiaceae family. It is suggested that the above recitation be replaced with “pectin that is derived from a plant of the Chenopodiaceae family.”

Claim 31 is indefinite since the term “optionally” in the claim does not clearly indicate whether the slightly acidic conditions or the aid of an enzyme or arabinofuranosidase is required. The metes and bounds of the claim are unclear because of the term. Additionally, the recitation “slightly acidic conditions at a pH between 6.0 and 7.5” is confusing since certain pHs in this range are not “slightly acidic.” Specifically, a pH of 7.0 is neutral, while a pH above 7.0 and up to 7.5 could be considered slightly basic.

Claim 32 is indefinite since “the arabinoxylan component” lacks antecedent basis as parent claims 24 and 29 do not recite an arabinoxylan component.

Claim 35 is indefinite since the term “optionally” in the claim does not clearly indicate whether catalase is required. The metes and bounds of the claim are unclear because of the term.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 24, 26-32, and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Budolfson et al. (US 6,232,101) in light of Scheller et al. (Frontiers in Biosensorics I, Fundamental Aspects. Birkhauser Verlag, Boston. 1997. page 64).

Budolfson et al. discloses “a method for causing gelling or increase of viscosity of an aqueous medium containing a gellable polymeric material having substituents with phenolic hydroxyl groups” (claim 1), thorough the addition of an enzyme of the oxidase type to the aqueous medium (column 2, lines 26-32). Though the preferred enzymes for increasing the viscosity of the aqueous medium are laccases (column 5, lines 44-48), “examples of other potentially useful, phenol-oxidizing oxidases in the context of the invention include the catechol oxidases (EC 1.10.3.1)” (column 5, lines 48-50), and that “the use of mixtures of different phenol-oxidizing oxidases may also be appropriate in some cases” (column 5, lines 50-52). According to Scheller et al., enzymes of EC 1.10.3.1 are tyrosinases (page 64, last paragraph, first sentence), thus Budolfson et al. teaches gelling the aqueous medium with a protein with tyrosinase activity. Therefore, performing the method of Budolfson et al. results in an aqueous (water-containing) medium comprising water and a gellable polymer component with phenolic substituents that had been modified by a protein with tyrosinase activity, which had caused the

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medium to gel or increase in viscosity. Clearly, Budolfson et al. anticipates instant claims 24 and 26.

Note that the gellable polymeric material may be a polysaccharide having substituents with phenolic hydroxyl groups (claim 2), such as cinnamic acid ester groups (claim 3), and that the polysaccharide may be an arabinoxylan or a material comprising pectin (claim 4). Thus, Budolfson et al. anticipates instant claims 28 and 29. Additionally, the gellable polymeric material may comprise of pectins derived from members of the plant family Chenopodiaceae (column 4, lines 15-17) (limitations of instant claim 30), and for the Budolfson et al. invention, the pectin may undergo a mild acid treatment and/or a treatment with an arabinofuranosidase for the partial removal of arabinose residues which improve the gelling properties of pectin (column 4, lines 48-54). Thus, instant claim 31 is also anticipated by the reference. Furthermore, the arabinoxylan which can serve as the gellable polymeric material may be an arabinoxylan derived from flour (claim 7), thus anticipating instant claim 32. Additionally, the polymer component of the gellable polymeric material may comprise monomeric substances such as simple phenols (column 3, lines 6-8), which meets the limitations of instant claim 27.

Finally, Budolfson et al. anticipates claim 36 as well as the optional limitations of claim 26 since it teaches that the resulting gelled product is subjected to a drying or dehydration procedure (claim 21). This dried or dehydrated gel can then be used to absorb liquid, thus resulting in a product in a rehydrated state (column 6, lines 36-39).

A holding of anticipation is clearly required.

Claims 24-26, 28-31, and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,998,176 in light of Scheller et al.

US '176 discloses "a method for causing gelling or increase of viscosity of an aqueous medium containing pectic material which has functionalities with phenolic hydroxyl groups" wherein the aqueous medium is treated with hydrolases (carboxylic ester hydrolase), oxidases (oxidoreductases, EC 1.10.3), and peroxidases. See claim 1. These enzymes can added to the medium simultaneously (column 9, lines 12-14). Note further that the oxidase may be a catechol oxidase (EC 1.10.3.1) (column 6, lines 47-57). According to Scheller et al., enzymes of EC 1.10.3.1 are tyrosinases (page 64, last paragraph, first sentence), thus US '176 teaches gelling the aqueous medium with enzymes which include a protein with tyrosinase activity. In sum, US '176 discloses producing an aqueous (water-containing) medium comprising water and a pectic (gellable) material with phenolic substituents that had been modified by a protein with tyrosinase activity (catechol oxidase), hydrolases, and peroxidases, wherein the medium had been gelled or its viscosity had been increased. Clearly, Budolfson et al. anticipates instant claims 24-26.

Note that pectin (a polysaccharide) may be derived from members of the plant family Chenopodiaceae and contains phenolic substituents derived from cinnamic acid (column 4, lines 17-22). Thus, US '176 anticipates instant claims 28-30. Additionally, for the patented invention, the pectin may undergo a mild acid treatment and/or a treatment with an arabinofuranosidase for the partial removal of arabinose residues which improve the gelling properties of pectin (column 5, lines 10-16). Thus, instant claim 31 is also anticipated by the reference.



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Finally, Budolfson et al. anticipates claim 36 as well as the optional limitations of claim 26 since it teaches that the resulting gelled product is subjected to a drying or dehydration procedure (claim 10). This dried or dehydrated gel can then be used to absorb liquid, thus resulting in a product in a rehydrated state (column 9, lines 36-39).

A holding of anticipation is clearly required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 24-32, 36, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budolfson et al. in view of US 5,998,176, and in light of Scheller et al.

As discussed above, Budolfson et al. anticipates claims 24, 26-32, and 36. However, Budolfson et al. does not expressly disclose that the phenolic substituents are modified by an enzymic mixture comprising not only of oxidoreductases (among them, catechol oxidases, EC 1.10.3.1), but also further comprising hydrolases and peroxidases.

US '176 discloses "a method for causing gelling or increase of viscosity of an aqueous medium containing pectic material which has functionalities with phenolic hydroxyl groups" wherein the aqueous medium is treated with hydrolases (carboxylic ester hydrolase), oxidases (oxidoreductases, EC 1.10.3), and peroxidases. See claim 1. These enzymes can added to the medium simultaneously (column 9, lines 12-14). Note further that the oxidase may be a catechol oxidase (EC 1.10.3.1) (column 6, lines 47-57). According to Scheller et al., enzymes of EC 1.10.3.1 are tyrosinases (page 64, last paragraph, first sentence), thus US '176 teaches gelling the aqueous medium with enzymes which include a protein with tyrosinase activity. In sum, US '176 discloses producing a aqueous (water-containing) medium comprising water and a pectic (gellable) material with phenolic substituents that had been modified by a protein with tyrosinase activity (catechol oxidase), hydrolases, and peroxidases, wherein the medium had been gelled or its viscosity had been increased.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have modified the Budolfson invention in order to included carboxylic ester hydrolases and peroxidase in addition to catechol oxidase in the treatment of an aqueous medium containing pectin as the gellable polysaccharide. One of ordinary skill in the art would have been motivated to do this since each of these enzymes had been shown in '176 to be suitable in gelling an aqueous medium containing pectin with phenolic substituents.

Additionally, the references differ from the claimed invention in that they do not expressly disclose the presence of a pharmaceutical adjuvant, cosmetic adjuvant, food or texturing agent in a composition comprising the modified medium of the Budolfson invention. However, Budolfson et al. discloses that the areas of application of the invention's resulting gelled or viscous products include medical/medicinal applications (material for drug encapsulation), agricultural/horticultural applications (slow release vehicle for pesticide delivery), and foodstuff applications (thickening and/or stabilizing agent) (column 1, lines 33-48). Clearly such uses of the disclosed product would have required that the product be combined with adjuvants and agents recited in instant claim 39. Therefore, claim 39 is rendered obvious by the references.

A holding of obviousness is clearly required.

Claims 24-34 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budolfson et al., US 5,998,176, and Scheller et al as applied to claims 24-32, 36, and 39 above, and further in view of Thalmann et al. (Eur. Food Res. Technol. 2002. 214: 276-281) and Tomita et al. (US 5,214,028).

As discussed above, Budolfson et al., US '176, and Scheller et al. render claims 24-32, 36, and 39 obvious. However, these references do not expressly that the protein with tyrosinase activity which is used to modify the aqueous medium is tyrosinase (EC 1.14.18.1), or that the enzyme used to modify the aqueous medium is inactivated after enzymatic modification of the medium takes place.

Thalmann et al. discloses that tyrosinase (EC 1.14.18.1) induces cross-linking in proteins (page 277, first column, second paragraph) and is a polyphenol oxidase (page 276, second column, last two paragraphs). Thalmann et al. teaches treating a protein solution (comprising an aqueous solution of sodium phosphate) with a tyrosinase solution, allowing the mixture to react, and then treating the reaction mixture with a denaturing buffer. Thus, the tyrosinase enzyme is deactivated.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have substituted catechol oxidases (EC 1.10.3.1), the protein with tyrosinase activity which is used to treat the aqueous medium, with tyrosinase (EC 1.14.18.1) in practicing the Budolfson invention. One of ordinary skill in the art would have been motivated to do this since tyrosinase is a phenol-oxidizing oxidase, as required by the Budolfson invention (column 5, lines 44-52). Moreover, tyrosinase (EC 1.14.18.1) would have caused the gelling of the aqueous medium of Budolfson et al. since the enzyme induces cross-linking in proteins. As pointed out in Budolfson et al., the gel formation as taught by the Budolfson invention occurs as a result of increased cross-linking (column 2, lines 62-67). Thus, claim 33 is rendered obvious by the reference. Furthermore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have inactivated the enzymes which cause the gelling of the aqueous medium of Budolfson et al. either chemically or thermally, since it would have discontinued the gelling process such that a desired medium viscosity is obtained. Furthermore, a denaturing buffer had been successfully used in Thalmann et al. in stopping a cross-linking reaction catalyzed by tyrosinase. Thus, claims 37 and 38 are rendered obvious by the references.

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The references discussed above also differ from the claimed invention in that they do not teach that the source of the protein with tyrosinase activity is potato.

Tomita et al. discloses that tyrosinases widely occur in potatoes (column 2, lines 10-11).

At the time the invention was made, it would have been obvious to have used tyrosinase (EC 1.14.18.1) from any of its sources, including potatoes. One of ordinary skill in the art would have been motivated to do this since tyrosinase (EC 1.14.18.1) would have been expected to have caused medium gelling due to their cross-linking activity regardless of the source of the tyrosinase. Thus, claim 34 is rendered obvious by the references.

A holding of obviousness is clearly required.

Claims 24-26, 28-31, 34, and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,998,176 in view of Thalmann et al. and Tomita et al., and in light of Scheller et al.

As discussed above, US `176 and Scheller et al. anticipate claims 24-26, 28-31, and 36. However, these references do not expressly that the protein with tyrosinase activity which is used to modify the aqueous medium is tyrosinase (EC 1.14.18.1), or that the enzyme used to modify the aqueous medium is inactivated after enzymatic modification of the medium takes place.

Thalmann et al. discloses that tyrosinase (EC 1.14.18.1) induces cross-linking in proteins (page 277, first column, second paragraph) and is a polyphenol oxidase (page 276, second column, last two paragraphs). Thalmann et al. teaches treating a protein solution (comprising an aqueous solution of sodium phosphate) with a tyrosinase solution, allowing the mixture to react,

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and then treating the reaction mixture with a denaturing buffer. Thus, the tyrosinase enzyme is deactivated.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have substituted catechol oxidases (EC 1.10.3.1), the protein with tyrosinase activity which is used to treat the aqueous medium, with tyrosinase (EC 1.14.18.1) in practicing the '176 invention. One of ordinary skill in the art would have been motivated to do this since tyrosinase is a phenol-oxidizing oxidase, as required by US '176 (column 6, lines 53-58). Moreover, tyrosinase (EC 1.14.18.1) would have caused the gelling of the aqueous medium of US '176 since the enzyme induces cross-linking in proteins. As pointed out in US '176, the gel formation as taught by the '176 invention occurs as a result of increased cross-linking (column 3, lines 41-54). Thus, claim 33 is rendered obvious by the reference. Furthermore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have inactivated the enzymes which cause the gelling of the aqueous medium of US '176 either chemically or thermally, since it would have discontinued the gelling process such that a desired medium viscosity is obtained. Furthermore, a denaturing buffer had been successfully used in Thalmann et al. in stopping a cross-linking reaction catalyzed by tyrosinase. Thus, claims 37 and 38 are rendered obvious by the references.

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Tomita et al. discloses that tyrosinases widely occur in potatoes (column 2, lines 10-11).

At the time the invention was made, it would have been obvious to have used tyrosinase (EC 1.14.18.1) from any of its sources, including potatoes. One of ordinary skill in the art would

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have been motivated to do this since tyrosinase (EC 1.14.18.1) would have been expected to have caused medium gelling due to their cross-linking activity regardless of the source of the tyrosinase. Thus, claim 34 is rendered obvious by the references.

Finally, the references differ from the claimed invention in that they do not expressly disclose the presence of a pharmaceutical adjuvant, cosmetic adjuvant, food or texturing agent in a composition comprising the modified medium of the US '176 invention. However, US '176 discloses that the areas of application of the invention's resulting gelled or viscous products include medical/medicinal applications (material for drug encapsulation), agricultural/horticultural applications (slow release vehicle for pesticide deliver), and foodstuff applications (thickening and/or stabilizing agent) (column 2, lines 48-62). Clearly such uses of the disclosed product would have required that the product be combined with adjuvants and agents recited in instant claim 39. Therefore, claim 39 is rendered obvious by the references.

A holding of obviousness is clearly required.

No claims are allowed. Claim 35 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan E. Fernandez whose telephone number is (571) 272-3444. The examiner can normally be reached on Mon-Fri 8:30 am - 5:00 pm.

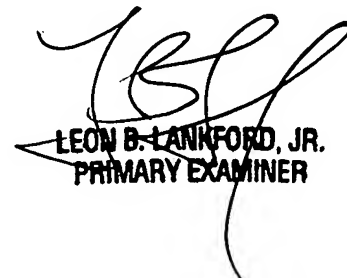
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Susan E. Fernandez  
Assistant Examiner  
Art Unit 1651

sef



LEON B. LANKFORD, JR.  
PRIMARY EXAMINER